

## Short summary

Fermilab User Executive Committee (2014-present)  
Fermilab Campus Planning and Facility Board (2014-present)  
Intensity Frontier Fellowship by Fermilab, USA in 2013  
2013 move to the Chicago as liaison between LHEP Bern and MicroBooNE  
Post-Doc at University Bern since 2010, neutrino physics, OPERA, MicroBooNE  
PhD at ETH Zürich 2006-2010, neutrino physics, OPERA, LAr R&D  
Study of physics at Humboldt Universität in Berlin 2001-2006  
Joint Master Thesis between Humboldt Universität Berlin and ETH Zürich 2005  
Publications: 48 from Inspirehep-database, h-factor: 23

## Education

Ph.D., October 2006 – November 2010 “**Charm production in the OPERA experiment and the study of a high temperature superconducting solenoid for a liquid argon time projection chamber**”, ETH Zürich, Prof. Andre Rubbia Institut für Teilchenphysik, Labor für Neutrinophysik, Switzerland  
Diploma, August 2005 – March 2006 “**Test of a high temperature superconductor coil in liquid nitrogen and liquid argon**”, Humboldt-Universität zu Berlin, Prof. T. Lohse, Germany and ETH Zürich, Prof. Andre Rubbia, Institut für Teilchenphysik, Labor für Neutrinophysik, Switzerland

## Scientific Experience

- **Associate Scientist** Fermilab, US, Technical Division 20.07.2015 – present  
Magnetic Measurements
  - Determining the main properties of magnets produced for various experiments and projects like US Larp, FAST, Mu2e, G-2 and Fermilab AD  
Neutrino physics experiment: MicroBooNE
  - Shift Coordinator: Organization of shifts during the run periods, setting up of the shift calendar, filling the shift calendar 2 months ahead of time
- **Post-Doc** Universität Bern, Albert Einstein Center for Fundamental Physics, Laboratory of High Energy Physics 01.07.2010 – 31.03.2015  
Neutrino physics experiment: MicroBooNE
  - Detector Physics group convener: Organization of various meetings and workshop session to prepare the detector calibration, and first results of data for detector performance evaluation. Coordinating and controlling the sub-systems preparation

efforts and unifying the approach and time schedules. Guiding the development of the calibration constants integration into the reconstruction framework. Preparing the run-control interface for calibration data taking.

- Proposal, design and installation of a new LED flasher system to allow better timing and gain calibration measurements of the optical detector system. Installation of thirty-six 16m long fibers, connected to electronics by a novel small size feed-through.
- Planning of detector commissioning, implementation of additional trigger sources for detector calibration and non-beam related events.
- Proposal, design and test of a steerable UV laser system. This system will be used to obtain a calibration map of the electric field in the drift chamber of the detector.

#### Neutrino physics experiment: LAr1-ND

- Proposal, design and test of a steerable UV laser system. This system will be used to obtain a calibration map of the electric field in the drift chamber of the detector.
- Proposal, design and test of a Cosmic Ray Veto system to tag outside events entering the detector volume. The goal is to decrease the contamination of gamma-ray background induced by cosmic particles.

#### Detector R&D in Bern: Argontube:

- R&D towards a novel 5m long drift chamber filled with liquid Argon. Development and test of a new approach for high voltage supply in drift chambers. Stress test of components for cryogenic use and installation of a Cockcroft-Walton circuit. Study of new ideas for scintillation light read-out. Design and test of a new pump for liquid Argon purification. Tests of a regeneration unit for Argon filter refurbishing.
- Building and operation of the Argontube detector. Installation of a cryo-cooler and detector modifications to increase the data taking period and quality.

#### Detector R&D in US: LarIAT, ArgoNeuT

- Installation of a new Muon beam line at Fermilab. Preparation and development of a new test stand to measure the Muon, pion and proton interaction rates in liquid Argon.
- Technology proof-of-principle test of liquid Argon drift chambers as possible large scale detectors for future neutrino beam experiments.

#### Grid Data Management for Medical and Liquid Time Projection Chamber Image Analysis:

- Novel ideas to the usage of secure data access and storage on the new high-energy physics-computing infrastructure Grid for medical application and physics experiments.
- High-energy physics secure data processing with pattern identification software on large computing clusters.

#### Neutrino physics experiment: OPERA

- Charm WG co-convener. Organization of meetings for software development and physics analysis.
- Charm particle detection efficiency study, investigation of background and comparison between data and simulation.
- Development of automatized event reconstruction search tools in the experiments software framework. Test of the proposed search strategy for tau-neutrino interactions.
- Data analysis and processing at INFN Gran Sasso laboratory and Bernese scanning stations

• **PhD student** ETH Zürich, Institute of Particle Physics

01.10.2006 – 30.06.2010

Detector R&D: LAGUNA, ArDM

- R&D focused on high temperature superconducting solenoids for particle detectors. Application of a magnetic field to an Argon drift chamber to improve momentum resolution and charge identification.

Neutrino physics experiment: OPERA

- Signal and background estimation and detector efficiencies for charmed particle decays in the run period 2008-2009. Efficiency study and comparison between data and simulation.
- Development of automatized event reconstruction search.
- Proposal of a uniform search strategy for tau-neutrino and other short-lived particle interactions.
- Data analysis and processing at INFN Gran Sasso laboratory and Bernese scanning stations.

Neutrino physics experiment: T2K

- Proposal of a new additional near detector at a distance of 2km. Enhancing the physics program to diminish the uncertainties for neutrino flux measurements.

## Awards and Grants

- 13.05.2014 Conference Support for Young Researcher, University Bern, CH
- 13.09.2013 Intensity Frontier Fellowship, Fermilab, USA

## Invited Talks

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| • Lake Louise Winter School, CA                                  | 20.02.2015 |
| • Seminar Series, University of Sheffield, UK                    | 10.10.2014 |
| • Seminar Series, RWTH Aachen, Forschungszentrum Jülich, Germany | 23.09.2014 |
| • Seminar Series, Liverpool University, UK                       | 01.09.2014 |

• 2 <sup>nd</sup> LArTPC (Liquid Argon Time Projection Chamber Detector) R&D Workshop, Fermilab, USA	08.07. – 09.07.2014
• Frontier Research in Astrophysics, Palermo, Italy	26.05. – 31.05.2014
• Seminar Series, Manchester University, Manchester, UK	15.05.2014
• Intensity Frontier Seminar, Fermilab, USA	13.03.2014
• All experiments meeting, Fermilab, USA	10.02.2013
• High Voltage in Noble Liquids Workshop, Fermilab, USA	08.11. - 09.11.2013
• 1 <sup>st</sup> LArTPC R&D Workshop, Fermilab, USA	20.03. - 21.03.2013
• NNN'12 conference, Fermilab, USA	04.10. - 06.10.2012
• Vulcano Workshop 2012, Vulcano, Italy	28.05. - 02.06.2012
• Swiss Grid School, Lugano, CH	22.06. - 24.06.2010
• Swiss Physical Society, Annual Meeting, Basel, CH	21.06. - 22.06.2010
• Int. School of Nuclear Physics, 31 <sup>st</sup> course, Erice, Italy	16.09. - 24.09.2009
• Swiss Physical Society, Joint Annual Meeting, Innsbruck, AT	02.09. - 04.09.2009
• Swiss Physical Society, Annual Meeting, Geneva, CH	25.03. - 27.03.2008

## **Affiliations/Commission work**

• Fermilab User Executive Committee	2014 – present
• Fermilab Campus and Facility Planning Board	2014 – present
• Member of the American Physics Society	2014 – present
• Detector Physics group convener, MicroBooNE experiment	2013 – present
• Snowmass Young Physicist movement, Intensity frontier convener	2012 – present
• Deputy Young Physicist representative of the OPERA experiment	2011 – 2012
• Charm Working Group co-convener, OPERA experiment	2009 – 2012
• Student Member of the Faculty Board, Faculty of Mathematics and Natural Sciences I, Humboldt-Universität zu Berlin, Germany	2002 – 2004
• Student Member of the Examination Board, Physics Institute, Humboldt-Universität zu Berlin, Germany	2002 – 2006
• Board Member of the Erasmus Student Network, Switzerland	2004 - 2012